David Garrett

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DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

P.O. Box 176 Jefferson City, MO 65102-0176

April 17, 2000

CERTIFIED MAIL – Z 290 181 425
RETURN RECEIPT REQUESTED

Mr. Thomas S. Sanicola
Environmental Engineer
Modine Manufacturing Company
1500 DeKoven Avenue
Racine, WI 53403-2552

RE: RCRA Facility Investigation Work Plan, Modine Manufacturing Company, Camdenton, Missouri

Dear Mr. Sanicola:

The Missouri Department of Natural Resources (MDNR), Hazardous Waste Program's (HWP) Permits Section and the MDNR, Division of Geology and Land Survey's (DGLS) Environmental Geology Section and Water Tracing Committee have reviewed the RCRA Facility Investigation (RFI) Work Plan, dated October 7, 1999, for the Modine Manufacturing Company (Modine) in Camdenton, Missouri. The review resulted in several comments and concerns regarding the dye trace investigation and field sampling plan which Modine must address prior to receiving approval for the RFI Work Plan.

Dye Trace Investigation

Comment 1, General

The evidence, given in the RFI report, does not indicate a hydraulic connection from either injection point to any of the points monitored. Interpretation of the data is complicated by the fact that numerous carbon packets were apparently contaminated with dyes prior to dye injection. This causes serious concern about any interpretations because, in essence, there are no useable "background" carbon packets. Since contaminated packets were placed in numerous monitoring points, it is possible that minute amounts of dye were accidentally introduced into the monitored water. Dames

and Moore's interpretation of a connection between MW-5 and MW-4 is based on minor fluctuations in fluorescein eluted from the packets at MW-4. The committee concluded that these fluctuations are statistically insignificant. Fluctuations of this magnitude are commonly caused by slight differences in lab procedure, reagents, and charcoal.

Comment 2, General

A record of precipitation should have been kept during the period of the water trace and included in the work plan. Knowing the amount of water that has fallen on the site would help determine if the study was conducted for a sufficient period of time.

Comment 3, General

Historically, groundwater at the site has been very deep, around 175 feet below ground surface (bgs). Monitoring Well MW-4 is only open from 42 to 158 feet bgs and has a history of being dry (1996 Comprehensive Groundwater Monitoring Evaluation Report). In the absence of any supporting water level information, it is uncertain whether groundwater flow during the duration of the dye trace was representative of long-term groundwater flow conditions in the vicinity of MW-4, thus rendering any related conclusions highly questionable.

Comment 4, Mulberry Well

The period for monitoring the Mulberry Well was too short. Well logs indicate that the Mulberry Well is cased to 435 feet bgs. It would take substantial time for the dye laden water to migrate the horizontal and vertical distance necessary to reach the Mulberry Well.

The low-level (0.017), single detection of dye in a water sample does not constitute a dye recovery. It should be noted that the recorded dye concentration from the water samples collected at the Mulberry Well can not be directly compared to dye concentration levels collected from the charcoal monitoring packets (bugs). The bugs are designed to absorb all dye from an unknown volume of water flowing through the packet. The result is a concentration of the dye stored in the activated charcoal of the monitoring packet that is derived from the surrounding groundwater. Water samples are, by nature, not concentrated and would be expected to reflect in-situ dye concentrations. The resulting units, as shown in Table 1, are unit-less and only reflect the relative strength of the dye.

Comment 5, Probe P-1

The results from the Rhodamine injection at P-1 are inconclusive. The area beneath the building is denied recharge from precipitation due to the concrete foundation. The area outside the building was also starved of precipitation due to a July to November drought. In any case, the duration of the study was not long enough to allow the dye to migrate to any of the monitoring wells nor formulate any conclusions regarding the hydraulic interconnection of the shallow subsurface materials beneath the building with those zones monitored by the wells. Furthermore, a negative dye trace result does not prove or disprove whether there is groundwater flow beneath the building. It is just a negative result.

Comment 6, Section 4.1

Since dye-contaminated bugs were lowered into the monitoring wells, it is likely that each time a contaminated packet was lowered into the wells, a portion of the dye was dissolved into the groundwater while some dye remained on the charcoal packet. Since there is no mention in the work plan that the monitoring wells were purged between successive bug installations, it is possible that the dye concentration in the groundwater monitoring wells was altered with each successive bug installation.

Comment 7, Section 4.1

The work plan states that the bugs, when removed from the wells, were placed in a cooler for shipment. However, the work plan does not discuss how the dye bugs were packaged for shipment to the laboratory. The work plan should state whether any measures were taken to separate the dye bugs from one another or whether any measures were taken to keep the dye bugs from contacting fluids in the cooler.

Comment 8, Section 4.3

The conclusions, regarding the dye investigation, are largely unsupported. Extensive data gaps exist in the work performed to date regarding water levels, potentiometric surfaces, hydraulic gradient, and sample handling. Issues that must be addressed in the work plan prior to drawing conclusions regarding the dye investigation include:

1) Collection of groundwater elevation measurements and preparation of potentiometric maps to verify the conceptual model of dye/groundwater movement;

2) Preparation of detailed well construction diagrams and boring logs for all monitoring wells which could be impacted by the dye investigation;

3) Preparation of a topographic contour map to an appropriate scale depicting the site and all monitoring well locations, including the former Hulett Lagoon area;

4) Measuring the distance between the Injection Well MW-5 and the Monitoring Well MW-4;

5) Calculation of the hydraulic gradients between MW-4 and MW-5 from the time of dye injection to recovery; and

6) Calculation of the vertical groundwater flow velocities based on formation hydraulic gradients, hydraulic conductivities, and effective porosity should be calculated for comparison with measured flow velocities based on dye travel time.

Comment 9, Appendix B

The Mulberry water well sample of 6/11/99 was preserved with nitric acid. Nitric acid destroys organic dye compounds. Buffering the solution back to a neutral pH does not restore the dye.

Field Sampling Plan

Comment 10, Section 5.2

This section states that the vertical extent of volatile organic compounds (VOCs) found in soil at B-13 is bounded by a sample with a concentration of 2.8 ppm taken at the bedrock surface. The detection at the bedrock surface could be the result of the seasonal presence of perched water that collects on top of the bedrock surface. This perched water may dissolve residual VOCs from the soil, then carry aqueous-phase VOCs deeper into the subsurface, eventually reaching the regional water table.

Comment 11, Figures 2, 3 and 4

These figures do not contain north-indicating arrows.

Comment 12, Section 6.6

The MDNR prefers that a bladder pump or micropurge methodology be used as opposed to bailing for the collection of VOC samples. VOCs have less chance for agitation, aeration, and volatilization by pumping at a low rate, thus allowing for a more representative sample. This is especially important when sampling for relatively low

concentrations of VOCs in wells that are slow to recharge. If one of the foregoing techniques cannot be used, then a bailer with a good quality bottom-emptying device operated by experienced sampling personnel should be utilized.

Comment 13, Section 6.6

MDNR recommends the Encore method be used for collecting soil samples for VOC analysis. This method collects the sample with minimal exposure of the soil to air and minimal handling of the sample is required prior to analysis, thereby facilitating more accurate and representative soil analysis results.

Comment 14, Additional Monitoring Wells and Hydrogeologic Characterization

Due to the inconclusive results of the dye investigation, the MDNR feels that additional hydrogeologic characterization is necessary to determine the origin of the groundwater contamination at the Modine facility. Specifically, additional groundwater monitoring wells appear necessary between the Modine property and the former Hulett Lagoon. Additional monitoring wells in this area will increase understanding of the groundwater flow directions and aid in the construction of more complete potentiometric maps. In addition, hydraulic conductivity testing should be performed in order to estimate the hydraulic conductivity in the saturated portions of the underlying groundwater unit. This additional site characterization is necessary to demonstrate the connection, or lack thereof, between groundwater contamination found at the former Hulett Lagoon and that at the Modine facility.

The MDNR-HWP, Superfund Section has identified Hamilton-Sundstrand (Sundstrand) and the City of Camdenton as potentially responsible parties (PRPs) for the former Hulett Lagoon. As a result of a recent meeting with MDNR, Sundstrand has agreed to enter into the cooperative program under the MDNR's Superfund Section's authority. Sundstrand has agreed to perform additional hydrogeologic characterization work at the former Hulett Lagoon and surrounding area. Preliminary plans include installation of additional monitoring wells and pumping tests at MW-5 and the Mulberry Well. These site characterization activities are planned for this summer.

Based on the preliminary scope of work proposed by Sundstrand, information obtained by Sundstrand during their site characterization activities may facilitate understanding of groundwater contamination at and around the Modine facility. Therefore, MDNR strongly recommends that Modine cooperate with Sundstrand by coordinating site characterization activities and exchanging information relating to site characterization activities. This would include access to groundwater monitoring wells on Modine's property. In an effort to coordinate Superfund and corrective action activities and to avoid duplicative work, Modine will not be required to install additional monitoring wells

at this time as part of the RFI, provided that adequate coordination and information sharing with Sundstrand occurs. Additional subsurface characterization activities by Modine may be necessary pending the results of Sundstrand's investigation of the former Hulett Lagoon and surrounding area. In addition, should Modine and Sundstrand fail to coordinate the upcoming site characterization activities including exchange of relevant information, the HWP will require Modine to perform additional work, including the installation of additional monitoring wells, to satisfy the RFI objectives specified in the Abatement Order on Consent.

Modine must respond to the above comments and submit a revised RFI Work Plan within 30 days of receipt of this letter. If you have any questions or would like to set up a meeting regarding these comments, feel free to contact me at (573) 751-3553.

Sincerely,

HAZARDOUS WASTE PROGRAM

Christine M. Kump
Environmental Engineer
Permits Section

CMK:bi

c: Ms. Shelley Woods, Attorney General's Office
Mr. Kurt Hollman, MDNR, Division of Geology and Land Survey
Mr. David Garrett, U.S. EPA Region VII